

What is claimed is:

1           1. An exhaust gas purifying system comprising:  
2           an oxidation catalyst disposed in an exhaust passage  
3 of an engine;  
4           a filter disposed in said exhaust passage at a  
5 position downstream of said oxidation catalyst to collect  
6 a particulate matter contained in exhaust gas;  
7           a first additional fuel control means which injects  
8 a first additional fuel into a cylinder during a forced  
9 regeneration of said filter and after a main fuel  
10 injection in said engine;  
11          a second additional fuel control means which  
12 supplies a second additional fuel to said oxidation  
13 catalyst after a rise in temperature of said oxidation  
14 catalyst up to an activation temperature of the catalyst  
15 and after the injection of said first additional fuel;  
16          a temperature detecting means for detecting an  
17 outlet temperature of said oxidation catalyst;  
18          an engine speed detecting means for detecting an  
19 engine speed of said engine;  
20          a load detecting means for detecting a load of said  
21 engine; and  
22          a second additional fuel supply quantity setting  
23 means which sets a supply quantity of said second  
24 additional fuel in accordance with information provided  
25 from said revolution detecting means and said load

26 detecting means and which changes the second additional  
27 fuel supply quantity in accordance with information  
28 provided from said temperature detecting means.

1           2. An exhaust gas purifying system according to  
2 claim 1,

3           wherein said second additional fuel supply quantity  
4 setting means comprises:

5           a first fuel injection quantity map in which a fuel  
6 supply quantity is set;

7           a second fuel injection quantity map in which a fuel  
8 supply quantity is set smaller than in said first fuel  
9 injection quantity map; and

10          a switching means which, when said oxidation  
11 catalyst outlet temperature has become lower than a  
12 predetermined value, sets said first fuel injection  
13 quantity map as a map for setting said second additional  
14 fuel supply quantity, and which, when said oxidation  
15 catalyst outlet temperature has become a value of not  
16 smaller than the predetermined value, makes switching from  
17 said first fuel injection quantity map to said second fuel  
18 injection quantity map.

1           3. An exhaust gas purifying system according to  
2 claim 2, wherein said first fuel injection quantity map is  
3 an increment map in which the fuel supply quantity of said  
4 second additional fuel to be injected into said cylinder

5 is set relatively large, and said second fuel injection  
6 quantity map is a decrement map in which the second  
7 additional fuel supply quantity is set relatively small.

1 4. An exhaust gas purifying system according to  
2 claim 3,

3 wherein said second additional fuel control means  
4 injects fuel into said cylinder to supply said oxidation  
5 catalyst with the fuel.

1 5. An exhaust gas purifying system according to  
2 claim 3,

3 wherein said second additional fuel control means  
4 injects fuel onto said exhaust passage to add the fuel to  
5 said oxidation catalyst.

1 6. An exhaust gas purifying system according to  
2 claim 1,

3 wherein said second additional fuel supply quantity  
4 setting means comprises:

5 a basic map in which a basic additional fuel supply  
6 quantity is stored; and

7 a correction means which, in accordance with the  
8 oxidation catalyst outlet temperature, corrects the fuel  
9 supply quantity obtained from said basic map, and

10 wherein the fuel supply quantity corrected by said  
11 correction means is set as the second additional fuel

12 supply quantity.

1           7. An exhaust gas purifying system according to  
2 claim 1,

3           wherein said second additional fuel supply quantity  
4 setting means comprises:

5           a first fuel injection quantity map in which the  
6 fuel supply quantity is set rather large;

7           a second fuel injection quantity map in which the  
8 fuel supply quantity is set smaller than in said first  
9 fuel injection quantity map;

10          a third fuel injection quantity map in which the  
11 fuel injection quantity is set still larger than in said  
12 first fuel injection quantity map; and

13          a switching means which selects said third fuel  
14 injection quantity map when the oxidation catalyst outlet  
15 temperature is lower than a first predetermined value,  
16 selects said first fuel injection quantity map when the  
17 oxidation catalyst outlet temperature is not lower than  
18 the first predetermined value and lower than a second  
19 predetermined value, and selects said second fuel  
20 injection quantity map when the oxidation catalyst outlet  
21 temperature is not lower than the second predetermined  
22 value.

1           8. An exhaust gas purifying system according to  
2 claim 1,

3 further comprising a forced regeneration start  
4 determining means which determines whether a forced  
5 regeneration of said filter is to be started or not.

1 9. An exhaust gas purifying system according to  
2 claim 8,

3 wherein said forced regeneration start determining  
4 means has a deposition quantity estimating means for  
5 estimating or calculating a deposition quantity of a  
6 particular matter deposited on said filter, and

7 wherein when the deposition quantity estimated or  
8 calculated by said deposition quantity estimating means  
9 reaches a value of not smaller than a predetermined value,  
10 the start of a forced regeneration of said filter is  
11 determined by said forced regeneration start determining  
12 means.

1 10. An exhaust gas purifying system according to  
2 claim 9,

3 further comprising an absolute pressure detecting  
4 means for detecting an absolute pressure on an inlet side  
5 of said filter and a differential pressure detecting means  
6 for detecting a differential pressure between an inlet-  
7 side pressure and an outlet-side pressure of said filter,  
8 and

9 wherein said deposition quantity estimating means  
10 estimates or calculates the deposition quantity of the

11 particulate matter on the basis of information provided  
12 from both said absolute pressure detecting means and said  
13 differential pressure detecting means.

1           11. An exhaust gas purifying system according to  
2 claim 1, further comprising:  
3           an oxygen mass flow rate detecting means for  
4 detecting or calculating a mass flow rate of oxygen fed to  
5 said filter; and  
6           a regeneration end determining means for determining  
7 a regeneration end of said filter in accordance with  
8 information provided from said oxygen mass flow rate  
9 detecting means and upon arrival of an integrated value of  
10 said oxygen mass flow rate at a predetermined value during  
11 a forced regeneration of said filter.

1           12. An exhaust gas purifying system according to  
2 claim 1,  
3           further comprising a regeneration end determining  
4 means for determining a regeneration end of said filter  
5 upon lapse of a predetermined time from the start of said  
6 forced regeneration.

1           13. An exhaust gas purifying system according to  
2 claim 1,  
3           wherein said engine is a diesel engine.

1           14.    An exhaust gas purifying method using an  
2   oxidation catalyst disposed in an exhaust passage of an  
3   engine and a filter disposed in said exhaust passage at a  
4   position downstream of said oxidation catalyst to collect  
5   a particulate matter contained in exhaust gas, and wherein  
6   a first additional fuel is injected into a cylinder during  
7   a forced regeneration of said filter and after a main fuel  
8   injection in said engine, and a second additional fuel is  
9   supplied to said oxidation catalyst after a rise in  
10   temperature of said oxidation catalyst up to an activation  
11   temperature of the catalyst and after the injection of  
12   said first additional fuel, said method comprising the  
13   steps of:

14           detecting an outlet temperature of said oxidation  
15   catalyst, an engine speed of said engine and a load of  
16   said engine; and

17           setting a supply quantity of said second additional  
18   fuel on the basis of said engine speed and said load and  
19   changing the second additional fuel supply quantity on the  
20   basis of said outlet temperature of the oxidation catalyst.

1           15.    An exhaust gas purifying method according to  
2   claim 14,

3           wherein said second additional fuel is injected into  
4   the cylinder of said engine.

1           16.    An exhaust gas purifying method according to

2 claim 14,

3 wherein said second additional fuel is injected onto  
4 the exhaust passage of said engine.

1 17. An exhaust gas purifying method according to  
2 claim 14, further comprising the steps of:

3 determining whether an integrated value of an oxygen  
4 mass flow rate from the time-point of arrival of the  
5 temperature of said filter at a predetermined temperature  
6 during execution of said forced regeneration has reached a  
7 predetermined value or not; and

8 terminating said forced regeneration upon arrival of  
9 said integrated value of the oxygen mass flow rate at a  
10 predetermined value.